

long time, which need in general to be examined only once in one, two, or three years.

The vital importance of this subject to the interests of safe, speedy navigation, will be impressed upon everyone by the disaster that befell the *Atlantic*, consequent upon being some twenty miles (or ninety seconds of time) out in her reckoning.

NOTES

LAST Thursday the gentlemen already named by us were elected Fellows of the Royal Society.

THE Baly Medal for physiological research has been awarded to Dr. Sharpey.

A PORTION of the collection made by the naturalist D'Alberty in New Guinea, and referred to in our Notes last week, has already arrived in England, and at the meeting of the Zoological Society, on Tuesday, June 17, Mr. Sclater, F.R.S., announced that among other valuable species, it contained both male and female specimens of a previously unknown Bird of Paradise of the Epimachina division, with a peculiarly long and curved beak, which he proposed to name *Drepanophorus albertisi*, after its discoverer.

A PROJECT has been set on foot by Colonel Grant, so well known from his African travels, to form a loan exhibition of skulls and horns of hollow-horned animals, in order that by observation and comparison of a large number of characteristic specimens, facts may be obtained regarding the form, sexual characters, and locality of each particular species. It is proposed to have as many as from twenty to fifty specimens of each species, so as to be able to form groups representing every stage in the life of each, as also to show the varieties of species in different localities. When from three to five thousand specimens of the one hundred and fifty existing species has been promised, means will be taken to secure the most suitable place in London for their exhibition.

ARRANGEMENTS have been made, under the sanction of Dr. Whewell's friends and executors, for the publication of a life of the late Master of Trinity, with selections from his correspondence and remains. The literary and scientific remains and correspondence will be edited by Mr. Todhunter, Lecturer, and formerly Fellow of St. John's College, Cambridge. The account of Dr. Whewell's college and university career will be written by Mr. W. G. Clark, Senior Fellow of Trinity College, Cambridge. Some of the most distinguished of Dr. Whewell's friends, to whom application has been privately made, have kindly placed their papers at the disposal of the editors, and expressed their approbation of the proposed work. The editors now ask in a more public manner for the loan of letters or other materials which will assist them in their labours. Mr. J. L. Hammond, Fellow of Trinity, as the surviving executor under Dr. Whewell's will, has undertaken to receive, on behalf of the editors, any documents that may be intrusted to them, all of which will be catalogued and carefully preserved, and returned within such limits of time as may be prescribed.

A CONFERENCE took place on Saturday, in promotion of a project to which we have already alluded as the "Trades Guild of Learning," for extending the advantages of university education to the working and middle classes of this country. It is proposed that local organisations shall be formed in various towns, and put into communication with a central guild, for the purpose of defraying the cost of the attendance of duly authorised lecturers sent from the Universities of Oxford and Cambridge, to conduct classes and deliver lectures on subjects, such, for example, as Political Economy, English Literature, Force and Motion,

Astronomy, Physical Geography, &c. Technical education is to form a leading department of the scheme, and it appears that Nottingham, Derby, and Leicester have already made arrangements and fixed dates for receiving the lectures, and that the authorities of both Universities, but that of Cambridge especially, have given cordial encouragement to the idea. Saturday's conference was very fairly attended by representative working men in the capacity of delegates from societies more or less numerous and powerful, and the whole day from eleven in the morning until seven in the evening was occupied in the discussion of the project. Mr. Samuel Morley, M.P., presided for the first few hours, and was succeeded in the chair by Mr. Mundella, M.P. With them were the Rev. H. Solly, Mr. James Stuart, M.A., Hon. Sec. to the Syndicate, who is actively engaged in furthering the scheme in connection with the Universities, Mr. Webster, Q.C., and other gentlemen, and a few ladies. It was agreed that women should not be excluded from the advantages of the guild.

ON June 7 a meeting was held of the Druitt Testimonial Committee, at which it was reported that a handsome silver cup, along with 1215*l.*, was to be presented to Dr. Druitt, who is still in India.

THE subscribers to the Children's Hospital, Bristol, have resolved to admit female practitioners to the medical staff of the hospital.

THE following, in alphabetical order, have passed first-class in Natural Science at St. John's College, Cambridge:—Clough, Jukes-Browne, Koch, Marshall, Sollas. Of the above, Marshall has been elected to a Foundation Scholarship, Clough, Jukes-Browne, Koch, Sollas (scholar 1872) have been awarded exhibitions.

IN the last issued Part of the *Birds of Europe*, which has just appeared, the name of Mr. Sharpe is no longer associated with that of Mr. Dresser as co-editor. The former of these two gentlemen has been compelled, on account of his many duties at the British Museum, to retire from his connection with the work which he was so instrumental in organising, and Mr. Dresser is now sole editor. The Viscount Walden, F.R.S., President of the Zoological Society, has relieved him of part of his considerable task, by undertaking to write most of the synonyms of the future parts, which will be sufficient guarantee for its accuracy and exhaustiveness.

THE concluding Part of Dr. W. L. Buller's *Birds of New Zealand* has just been issued. The genus *Apteryx*, the last discussed, and most interesting in the avifauna of these islands, is divided into four species at least, of which *A. haasti* closely resembles *A. owenii*, except in size, being considerably larger. The author also considers that the evidence, as far as it goes, is in favour of *A. haasti* differing from *A. maxima* of M. Jules Verreaux, which he thinks represents another species as large as a full-grown turkey. The Introduction contains several interesting supplementary notes; further facts are given in favour of the Quail Hawk (*Hieracidea nova-zealandiae*) being distinct from the Sparrow Hawk (*H. brunnea*); the validity of *Platycercus alpinus*, as a species, is established; the Huia bird (*Heteralocha acutirostris*) is placed among the Starlings, close to *Creadion* instead of with the *Upupidae*, and *Tribonyx mortieri* is included in the New Zealand fauna. There are seven excellent plates, and a supplementary series is promised.

THE recent changes which took place in French policy have deprived science of an active and able leader in M. Jules Simon, who was sparing no trouble to promote new inquiries and restore French science to its pristine activity. His imme-

date successor has had no time to make any show of his intentions. M. Batbie seems to feel inclined to accept the inheritance of M. Jules Simon, as far as it relates to the *Facultés* (the equivalent of the several English Universities). It is supposed on good grounds that all the schemes of M. Jules Simon for building a new *Faculté* of Sciences on the back part of the Luxembourg will not be interfered with by the sudden presidential change. It remains to be ascertained what will be the working of the new system on the courses of lectures delivered by unofficial men of science.

M. LEVERRIER has entered on his new office of Director of the French National Observatory. The Observatory Board has decided on his formal proposition that they shall co-operate with the Bureau des Longitudes for taking a new measure of the French arc from Dunkerque to Oran *via* Spain. Commander Perrier will be the chief geodesist for that most important survey.

M. WOLF has taken a series of magnificent photographs with Leon Foucault's siderostat during the last partial eclipse. He was then testing the photographic process which he intends using in Japan on the next Transit of Venus. The Japan Embassy was present at the operations and exhibited a great deal of truly scientific curiosity.

M. THIERS is now busy studying geology for the purpose of writing an essay on the destiny of mankind. He will take an anti-Darwinian view of the question. M. Daubree is his teacher for geology. He was taught in astronomy ten years ago by M. Leverrier, and in Natural Philosophy by M. Mascart, lecturer at the Collège de France.

M. BARTHELEMY SAINT-HILAIRE has already resumed his work of translating Aristotle and commenting upon it. The volumes now in hand relate to scientific subjects.

MESSRS. MACMILLAN & Co. will shortly publish the "Elements of Embryology," by Michael Foster, F.R.S., Professor in Physiology at Trinity Coll. Cambridge, and F. M. Bal-four, Scholar of Trinity College, Cambridge.

THE French Academy has named a commission to prepare a list of candidates for the place of Foreign Associate, vacant by the death of Baron Liebig. The commission is composed of MM. de Quatrefages, Liouville, Morin, Becquerel, Dumas, Chevreul, and Milne-Edwards.

TURIN possesses an Industrial Museum, which, though it has been established only a few years, is, according to *L'Institut*, one of the most complete in Europe, second only to the Conservatoire des Arts et Métiers de Paris. The value of this establishment has just been increased by the publication of a monthly periodical entitled *Annals of the Italian Industrial Museum*. The Director of the Museum is M. Codazza, and the Conservator, Mr. W. T. Jervis.

M. PAUL BROCA contributes to the *Revue Scientifique* an account of some researches he made about twelve years ago for the purpose of ascertaining the influence of education on the development of the brain. He took as his subject 20 attendants and 18 pupils of the hospital of Bicêtre, the average age of the former being 39½ years, and the average height 1'643 metre; the average age of the latter 26½ years, and the average height 1'689 metre. Notwithstanding the great advantage of the former in the matter of age—for it has been ascertained that the mean weight of the brain increases up to 40 years—the measurements made by M. Broca were very considerably in favour of the pupils, who had undergone a long training before being admitted to the hospital, and some of whom have since had a distinguished career. We can only here give the differences

between the various measurements of the two groups of heads, the + denoting the excess (in millimetres) in favour of the hospital pupils. Antero-posterior diameter—Maximum +4'89, inial +5'87; transverse diameter +2'91; cephalic cephalometric index -'55; inio-frontal curve—total +9'90, anterior part +9'25, posterior part +0'65; horizontal curve—total +16'06, anterior part +10'90, posterior part +5'16; transverse curve—bi-auricular +13'90, supra-auricular 11'70. M. Broca thinks that the results of the measurements prove, in the first place, that mental culture and intellectual work increase the volume of the brain, and in the second place that the increase takes place principally in the frontal lobes, which are the seat of the highest faculties of intelligence. Very important conclusions in favour of the spread of the higher education may be drawn from these statistics.

WE are glad to see, from a pamphlet by Mr. Ellery (just elected F.R.S.), "Notes on the Climate of Victoria," that a beginning has been made to put into shape the multitude of statistics which have already been accumulated as to the climate of that country. With regard to the rainfall, we quote the following paragraph:—By selecting Melbourne as the locality in which the most extended series of observations have been obtained, we remark that in the years 1848, 1849, and in 1863, the rainfall was far above the average; in 1864, 1865, 1866, and 1870 it fell below the average, especially 1865, when it only reached 15'9 inches. In 1848 and 1849 extensive and destructive floods occurred, and again in 1863; in 1865 and 1866 the country suffered from a severe drought; and the year 1851, following the heavy rains of 1849, was also a dry one, although the amount of rainfall, if ever observed, cannot yet be ascertained. An opinion has often been expressed that there is a periodicity in the excessive rainfalls and droughts in Australia generally; but although the above results may give some slight grounds for this supposition, a far greater number of years' observations will be necessary from which to deduce any law of this kind.

THE United States Signal Corps has recently extended its series of observations in the form of a daily record of the surface and bottom temperature of the rivers and harbours upon which the several stations are situated. This, while of much interest in a meteorological point of view, is also of practical importance in connection with the subject of introducing useful food fishes into the rivers and lakes of the United States, as lately provided for by Congressional enactment. It is well known that the possibility of introducing salmon into any given stream will depend upon the relationship of its temperature during the summer and autumn to the particular species; some kinds, as the true salmon of the North Atlantic (*Salmo salar*), requiring a summer minimum of at least sixty to sixty-five degrees, while others will bear a higher temperature.

AN institution has been founded in Vienna by M. Anton M. Pallac, which he calls a Rudolfinum, or Students' Home—a college of technical science for students of any nationality. It is now announced that this gentleman has arranged with the officers of the Rudolfinum to furnish free lodgings in that building to three hundred professors and teachers, of all nations and countries, who intend visiting the exhibition of 1873. The offer is made for the months of July, August, and September, and applies alike to the professors of royal academies and the teachers of any kind of public schools. Early application is to be made, giving in each instance the name, address, and teaching position of the applicant, locality of school or institution in which he is engaged, with the date and length of time of his desired occupancy of these free lodgings. The application is to be addressed to the administration of the Rudolfinum, 4, Moierhofgrasse, Vienna.

THE principal paper in the last number (Vol. ii. No. 4) of the

"Proceedings of the Bath Natural History Society," is a long address by the president, the Rev. Leonard Blomefield, F.L.S., F.G.S., on "Local Biology," containing many valuable hints as to the objects which members of such societies ought to have in view, illustrated by many interesting facts and recent observations in natural history. He shows how valuable the field work of local scientific societies might be made when intelligently and judiciously conducted, not only in collecting facts as to local biology, but in helping to solve many of the most important problems which are at present occupying the attention of biologists. The main qualification for efficient work of this kind is an intelligent and sharp look-out. Mr. Blomefield concludes his paper by some remarks on the faunas of Bath and Somerset. We are glad to see the address has been printed separately, and we would recommend it to the attention of all local scientific societies. The two other scientific papers in this number are on "Devonian Fossils from the Sandstones on the N.E. of the Quantocks," by the Rev. H. H. Winwood, F.G.S., and "The Geographical Position of the Carboniferous Formation in Somersetshire, with Notes on possible Coal Areas in adjoining Districts in the South of England," by J. McMurtrie, F.G.S., the latter illustrated by a well-constructed map.

WE have received a wonderfully cheap pennyworth in the shape of a "Descriptive Guide to the Fossil Collection" of the Museum of the Leeds Philosophical and Literary Society. The pamphlet is interestingly written and well arranged, and contains a long and valuable list of useful books of reference on Palæontology.

THE Third Annual Report of the Devon and Exeter Albert Memorial Museum, Schools of Science and Art, and Free Library, is altogether a very satisfactory one. Great facilities are offered for scientific study and laboratory practice, and these appear to be largely taken advantage of. The number of individual students during the current session is 89, and the subjects at present taught in the school are Mathematics, Theoretical Mechanics, Physical Geography, Geology, Acoustics, Light and Heat, Vegetable Anatomy and Physiology, Systematic and Economic Botany, Magnetism and Electricity, and Inorganic Chemistry with laboratory practice. According to the library statistics, a very large increase during the past year has taken place in the number of scientific books sought for, both in the consulting and lending libraries.

THE following is the ephemeris of Tempel's Comet for the days named as, calculated by Mr. Hind for Greenwich midnight:—

	True R.A. h. m. s.	True N.P.D. ° ' "	Log Δ
1873			
June 20	16 14 50.1	111 18 19	9.91982
22	14 23.7	111 38 44	9.92529
24	14 4.9	111 58 53	9.93106
26	13 53.9	112 18 45	9.93711
28	13 51.1	112 38 19	9.94342
30	13 56.7	112 57 34	9.94996
July 2	14 10.8	113 16 31	9.95671
4	14 33.6	113 35 10	9.96365
6	16 15 5.3	113 53 30	9.97077

THE additions to the Zoological Society's Gardens during the past week include a black Iguana (*Melopoceros cornutus*) from San Domingo, presented by Mr. John Dutton; two golden Tench (*Tinca vulgaris*), presented by Lord Herbrand Russell; two black Kites (*Milvus migrans*), presented by Mr. H. F. Blissett; two starred Tortoises (*Testudo stellata*) from India, presented by Capt. C. S. Sturt; a smooth-headed Capuchin (*Cebus monachus*) from Brazil, presented by Mr. J. A. Horsford; a Rhesus Monkey (*Macacus erythraeus*) from India, presented by Mr. G. Cork; an Entellus Monkey (*Semnopithecus entellus*) from India; four Sturgeon (*Acipenser sturio*); two American Rice-birds (*Dolichonyx oryzivora*); five horned Lizards (*Phrynosoma cornutum*) from Texas, purchased; a Lion (*Felis leo*) from Africa; a Collared Mangabey (*Cercocebus collaris*), a Diana Monkey (*Cercopithecus diana*), and a Moustache Monkey (*C. cephus*) from W. Africa, on approval.

SCIENTIFIC SERIALS

THE *Journal of Botany* for May commences with a critical investigation, illustrated by a plate, by the editor, of the very common but badly understood Dock, *Rumex obtusifolius*, which is followed by two papers on the distribution of plants, Additions to the British lichen flora, by Rev. M. Crombie, and Additions to the flora of Berkshire, by James Britten. In this number is also the very useful annual list of the new species of phanerogamous plants described in periodicals published in Great Britain during the year 1872. The plate which now accompanies every number is a great addition to the value of this magazine.

In the June number the illustrated article is by Mr. W. P. Hiern, on *Physotrichia*, a new genus of Umbelliferous plants from Angola, from the Welwitschian collection. Mr. F. Townsend contributes a paper on a much controverted subject, some points relating to the morphology of *Carex* and other Monocotyledons. The short notes and queries are, as usual, not the least interesting portion of these two numbers.

Poggendorff's *Annalen der Physik und Chemie*, Supplement vol. vi., part. I. This number contains the first instalment of a series of researches on the volume constitution of solid substances; a lengthy paper in three parts, the first being introductory and theoretical, the second describing methods, and the third detailing results in the case of chlorides, bromides, and iodides.—Prof. Schwedoff of Odessa follows with an interesting paper, in which he establishes a correspondence between the propagation of electrical currents in thin conducting insulated plates and that of light rays in transparent media. A "ray of electricity" is represented by the line drawn from a pole to any given point of the body, and means simply the direction in which electrical "masses" (in the plate) are attracted to the pole or repelled from it. He shows that the intensity of such rays is inversely proportional to distance from the pole; that they are reflected (it may be oftener than once), from the edges, the angles of reflection and incidence being equal; that they do not lose intensity by reflection, nor suffer change of sign. His theory and mode of experiment are illustrated by figures.—An article by Dr. Heinrich Schneebeli on bar-magnetism, contains a full and thorough investigation of magnetic moment in permanent bar-magnets, and more especially of the position of the magnetic pole; this is determined by two different methods which do not suppose a knowledge of the law of distribution of the magnetic fluid, and the results (closely agreeing), are applied in correction of the tangent galvanometer.—Carl Pape contributes a determination of the optical constants of blue vitriol, and Alexander Müller the first part of studies on chloride of iron solutions without change of aggregate state.—Among the extracted matter may be noted an article by Kohlrausch on the reduction of the Siemens unit of galvanic resistance to absolute measure, and one by Edlund on the nature of electricity, which has already appeared in English form.

THE *Monthly Microscopical Journal* commences with an article by Dr. R. L. Maddox on an Entozoon with ova, found encysted in the muscles of a sheep, which he calls *Cysticercus ovipariens*. Then comes a very valuable paper on the development of the face in the sturgeon, by Mr. Parker, F.R.S., which, if followed by the description of a few more type-forms, will render the development of that complicated portion of the body, the head, one of the most easily understood sections of the vertebrate body. Mr. Joseph Needham gives a concise résumé of the methods employed for cutting sections of animal tissues for microscopical examination, in which he strongly advocates the method of freezing as "the simplest and most elegant mode" of obtaining sections of yielding tissues. Assistant-Surgeon Woodward describes how that a $\frac{1}{4}$ th objective, sent to him by Mr. Tolles to test, gave a balsam angle of less than 80°, whilst a second, a $\frac{1}{4}$ th of peculiar construction, having four combinations instead of three, gave the high angle of more than 100° when fully closed, and so exceeding the extreme limit assigned as attainable by Mr. Wenham. Mr. H. Davis gives further facts in support of the originality of his theory respecting the survival of Rotifera after desiccation.

SOCIETIES AND ACADEMIES

LONDON

Royal Society, May 8.—"Researches in Spectrum Analysis in connection with the Spectrum of the Sun."—No. II. By J. Norman Lockyer, F.R.S.